



Affordability Challenges for DoD Weapon Systems

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Agenda

- Background
- Budget Outlook
- Acquisition Policy Changes
- Modernization Challenges
- Case Example (Joint Light Tactical Vehicle)
- Parting Thoughts



Background – DoD Weapon Systems Cost Growth

“In a number of programs, the Department of Defense has experienced significant growth over the original estimates in the development and procurement of weapon systems. These cost increases are detrimental to the warfighter and the taxpayer. The result is generally later delivery of capability and a reduction in the quantity purchased.”

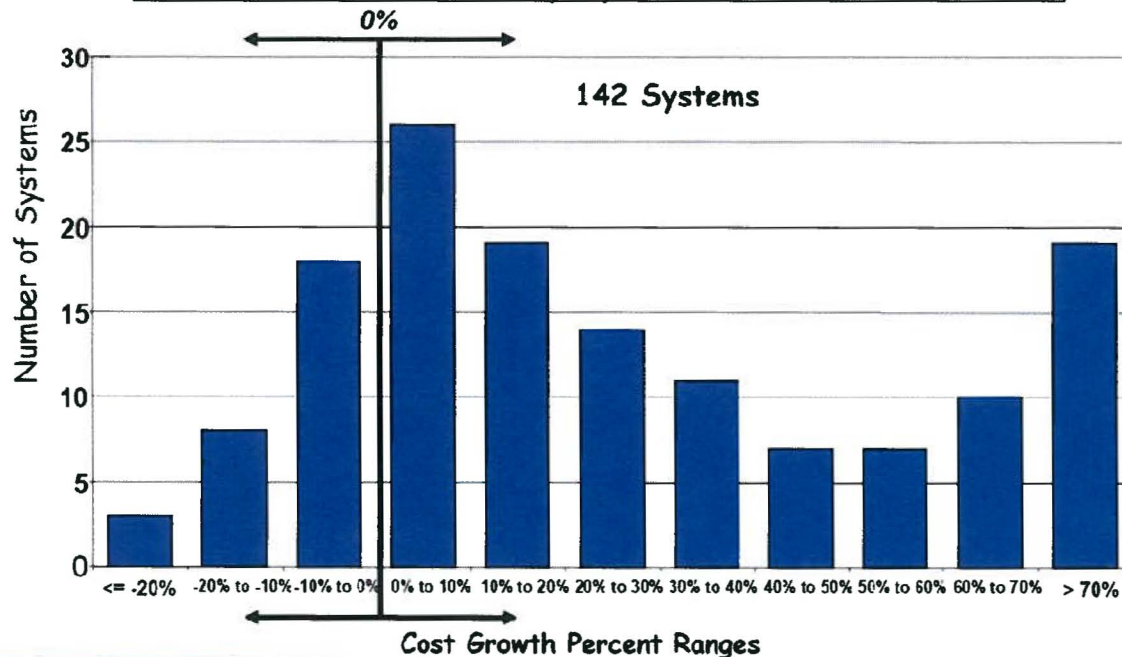


Hon. John J. Young Jr.
Under Secretary of Defense for Acquisition,
Technology and Logistics
July 30, 2007 Memo to the Services
& Defense Agencies.



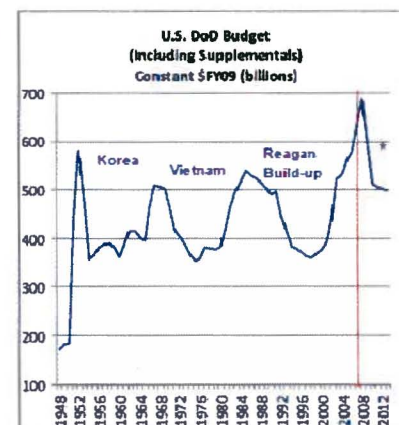
OSD CAIG Study January 2003 Cost Growth Summary

Source: OSD Cost Analysis Improvement Group (CAIG) Study: Cost Growth of Major Systems



Recent Defense Business Board Findings*

- The total acquisition budget for all MDAPs has more than doubled in the past seven years (from \$782B to \$1,702B)
- Of the approximately \$919B in increased portfolio budget from 2000 – 2007, nearly half (\$401B) is for program cost growth over the baseline. The other half is for new programs or baseline changes.
- Five Programs accounted for over 50% of the program cost growth over the baseline - Future Combat System (Army), Joint Strike Fighter (Navy/AF), SSN 774 (Navy), Chemical Demilitarization (Army), and Evolved Expendable Launch Vehicle (EELV)
- History suggests the Department is entering a period of fiscal constraint in a tough economy with deficit and competitive spending pressures.



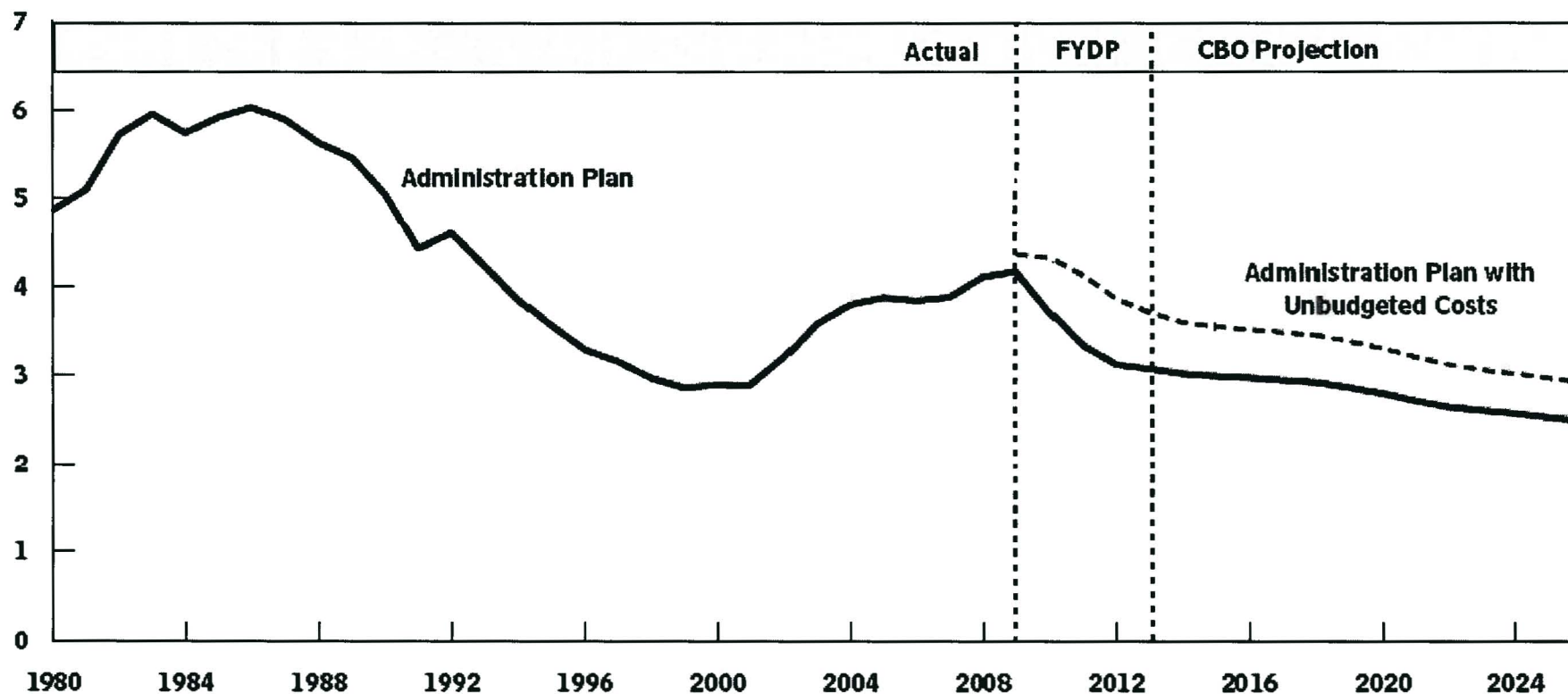
* Future Year Defense Plan Projections, based on OMB and CBO data

Budget Outlook



Defense Resources as a Percentage of Gross Domestic Product

(Percent)

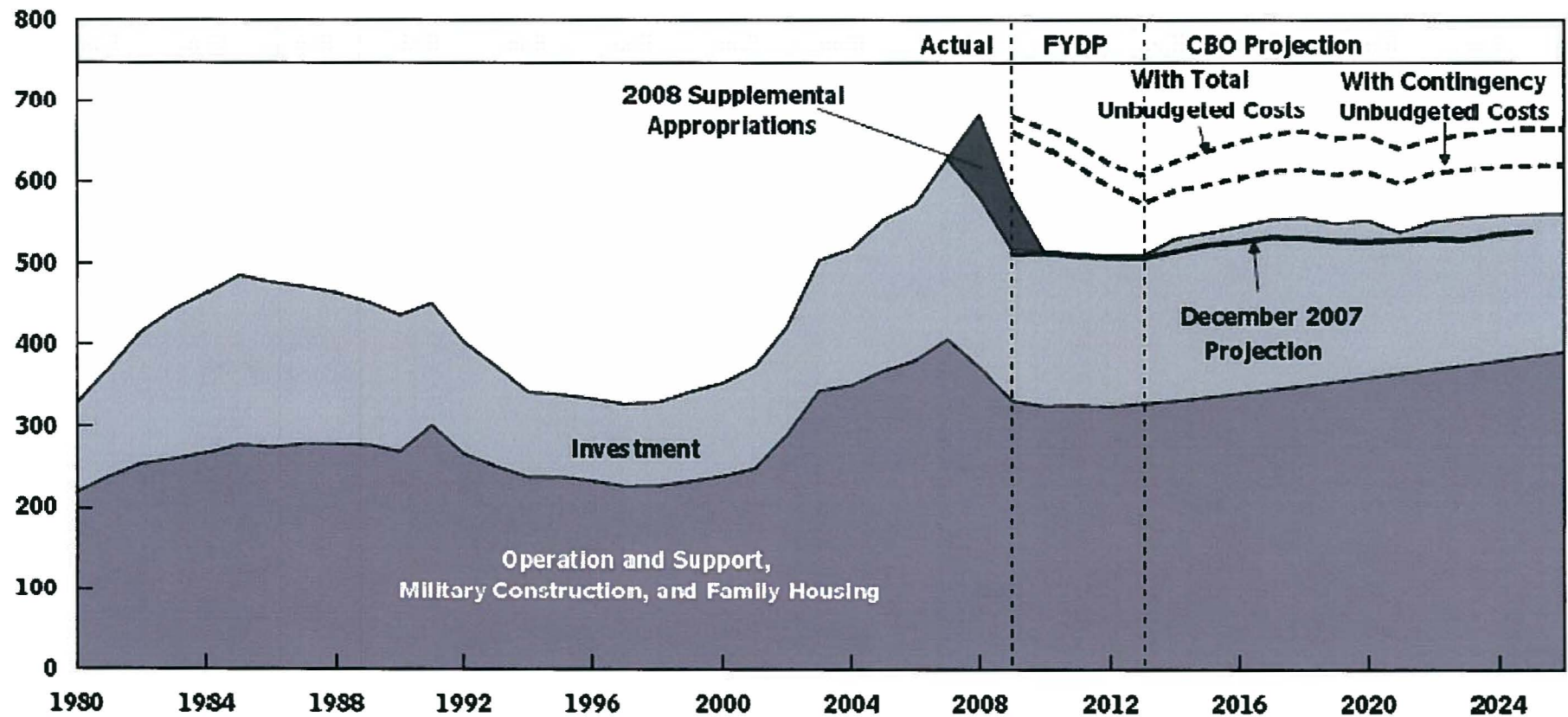


Source: Congressional Budget Office.

Note: FYDP = Future Years Defense Program.

Past and Projected Resources for Defense

(Billions of 2009 dollars)

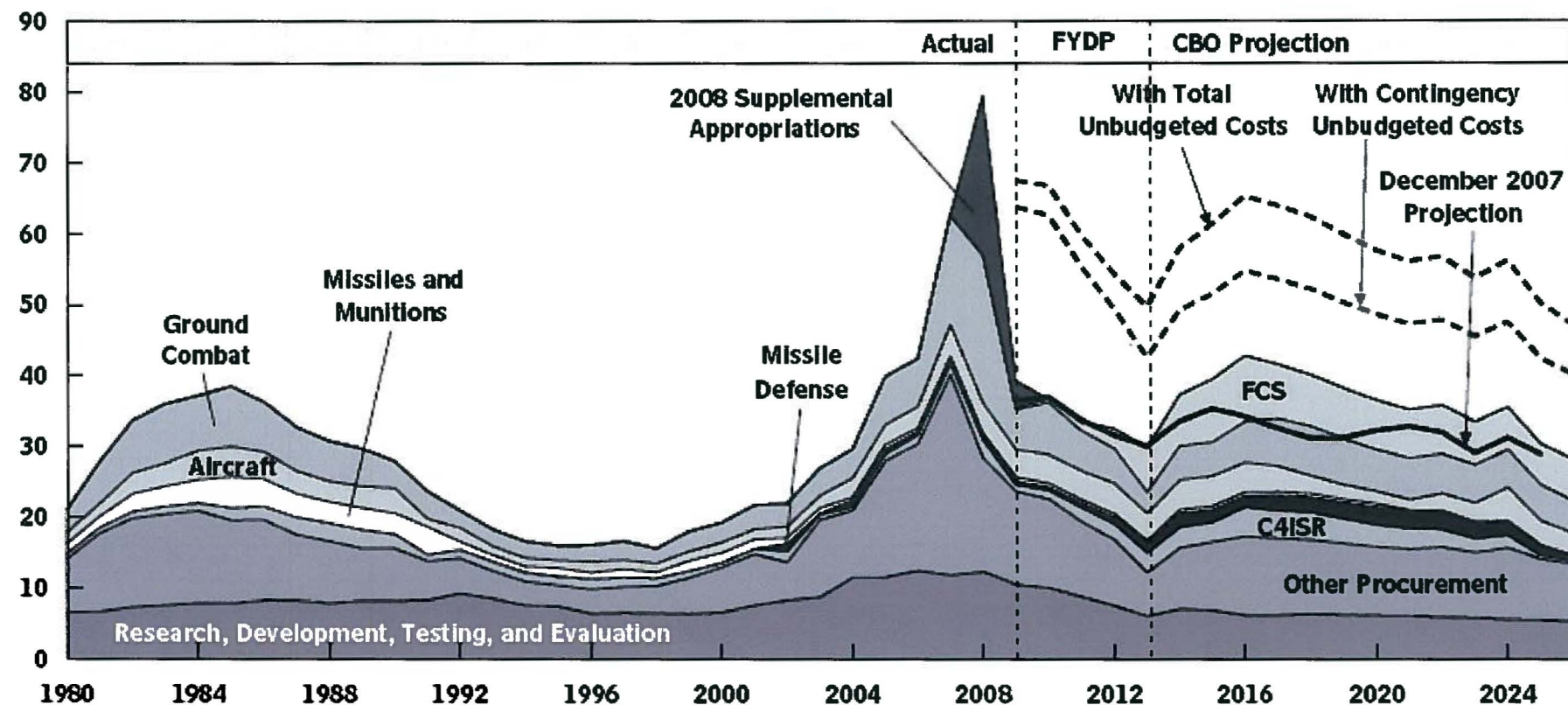


Source: Congressional Budget Office.

Note: FYDP = Future Years Defense Program.

Past and Projected Resources for Army Investment

(Billions of 2009 dollars)



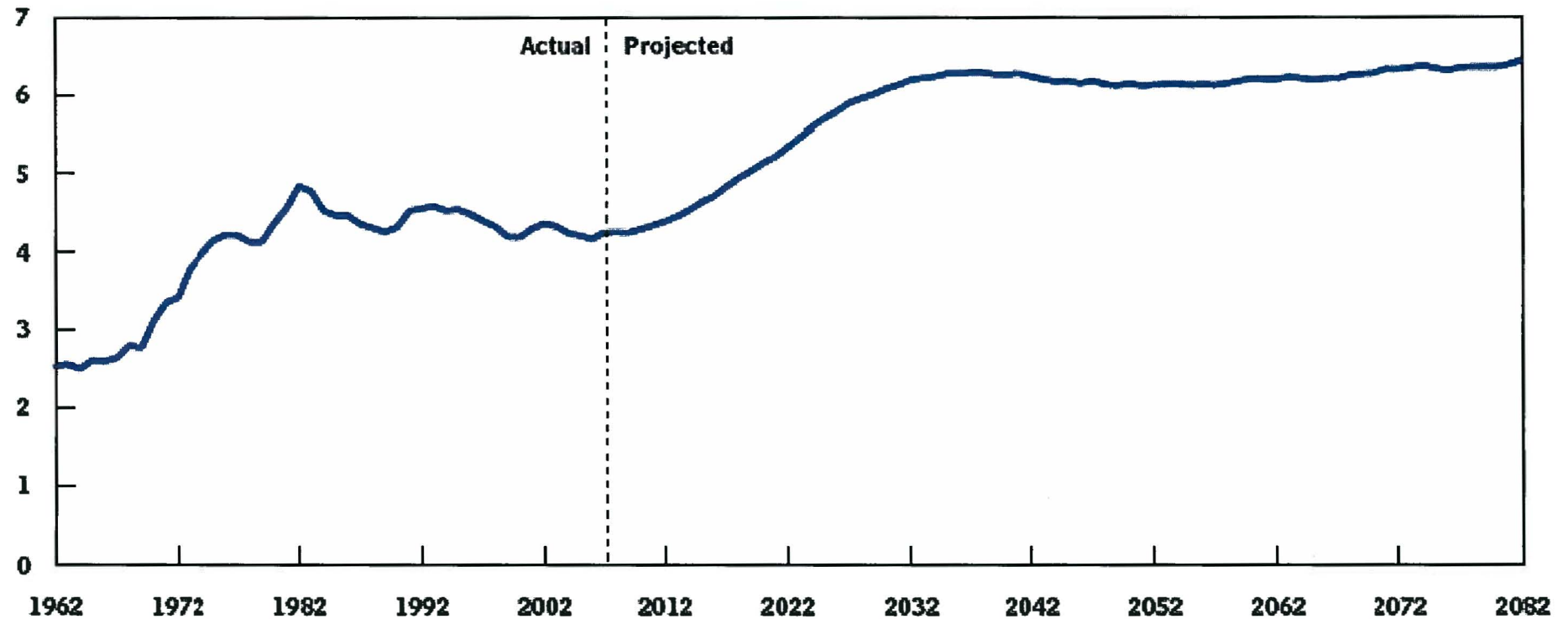
Source: Congressional Budget Office.

Note: FYDP = Future Years Defense Program; C4ISR = command, control, communications, computers, intelligence, surveillance, and reconnaissance; FCS = Future Combat Systems.

Other Pressures – Social Security

Spending for Social Security as a Percentage of Gross Domestic Product

(Percent)

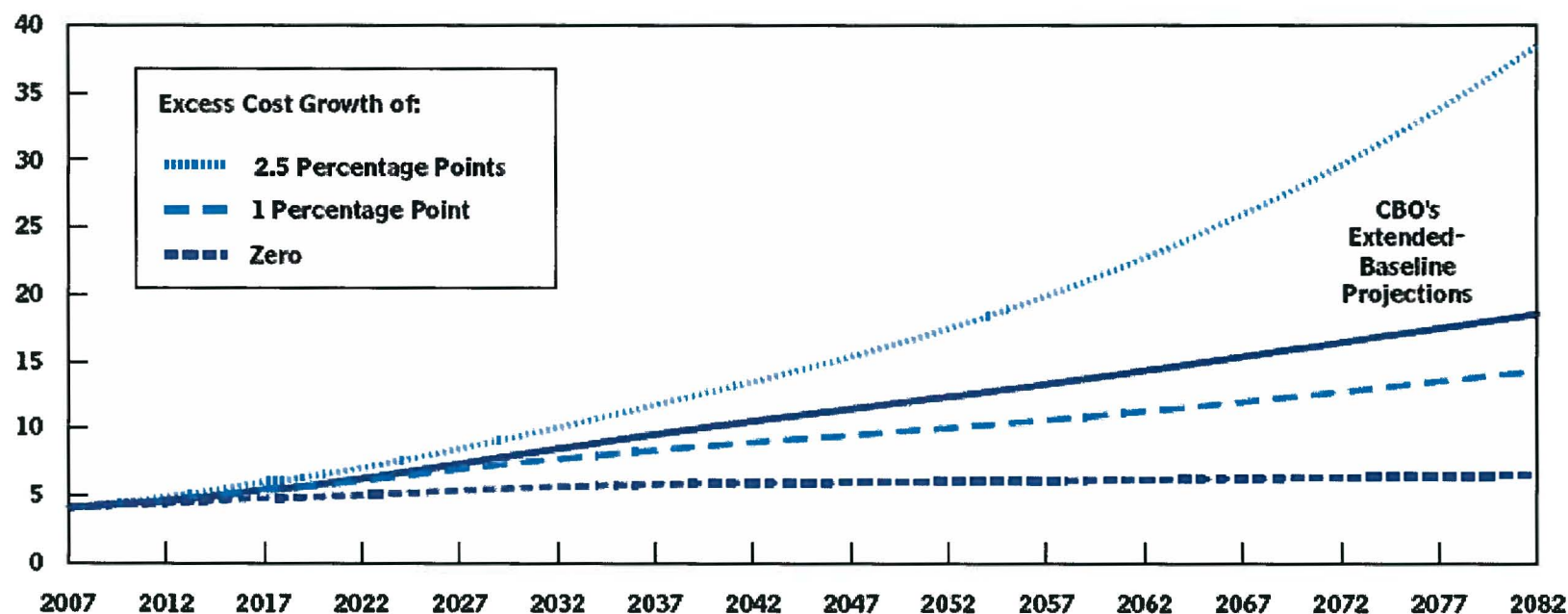


Source: Congressional Budget Office.

Other Pressures – Medicare & Medicaid

Federal Spending for Medicare and Medicaid as a Percentage of Gross Domestic Product Under Different Assumptions About Excess Cost Growth

(Percent)



Source: Congressional Budget Office.

Notes: Excess cost growth refers to the number of percentage points by which the growth of annual health care spending per beneficiary is assumed to exceed the growth of nominal gross domestic product per capita.

The extended-baseline scenario adheres closely to current law, following CBO's 10-year baseline budget projections from 2008 to 2017 and then extending the baseline concept in its projections for the rest of the years in the period, to 2082.

Acquisition Policy Changes

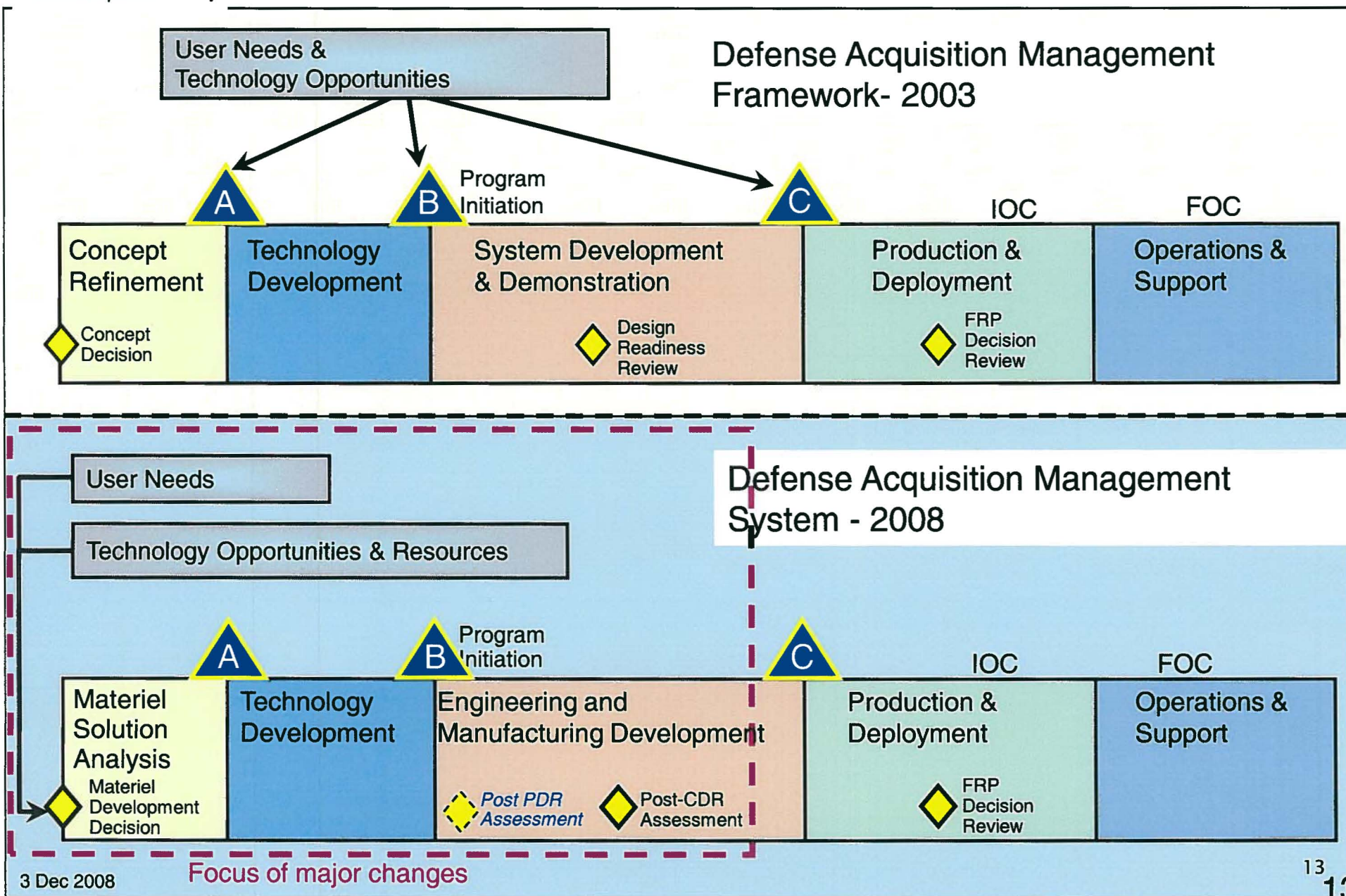


Acquisition Policy Changes

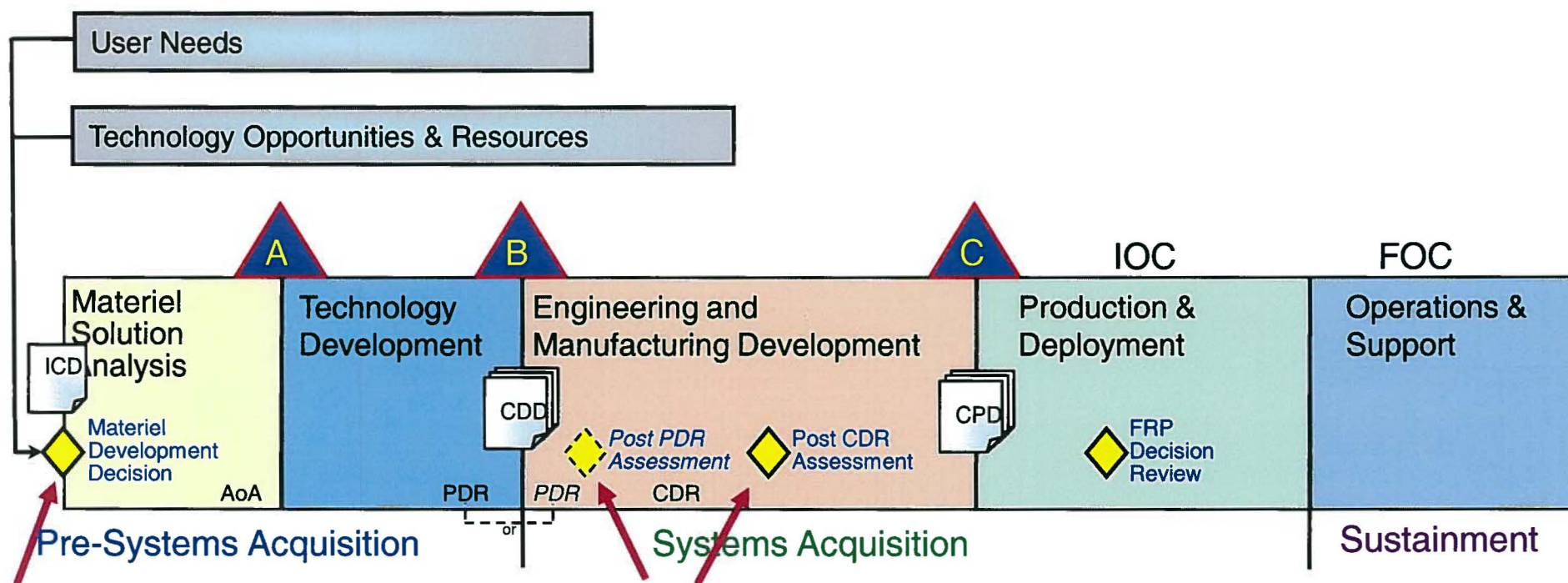
- Historical cost growth for DoD weapon systems is a big reason for recent changes to acquisition policy. (FY06-FY08)
- Congress perception - Nunn McCurdy law had been in place since 1982, but:
 - Insufficient consequences
 - Cost growth continued
 - Perception of “Rubber Baselines” & lack of discipline
- Reaction:
 - FY06 NDAA:
 1. Tightened Nunn McCurdy rules and measurements
 2. Section 2366 required USD(AT&L) certify MDAPs at MS B
 - FY07 NDAA - Added three more criteria for MS B certification
 - FY08 NDAA - Required USD(AT&L) to certify at MS A
 1. Program costs have been submitted
 2. Program is non-duplicative
 3. Valid requirement exists

Result is to address cost much earlier in the life cycle

Comparison of 2003 vs. 2008 Frameworks



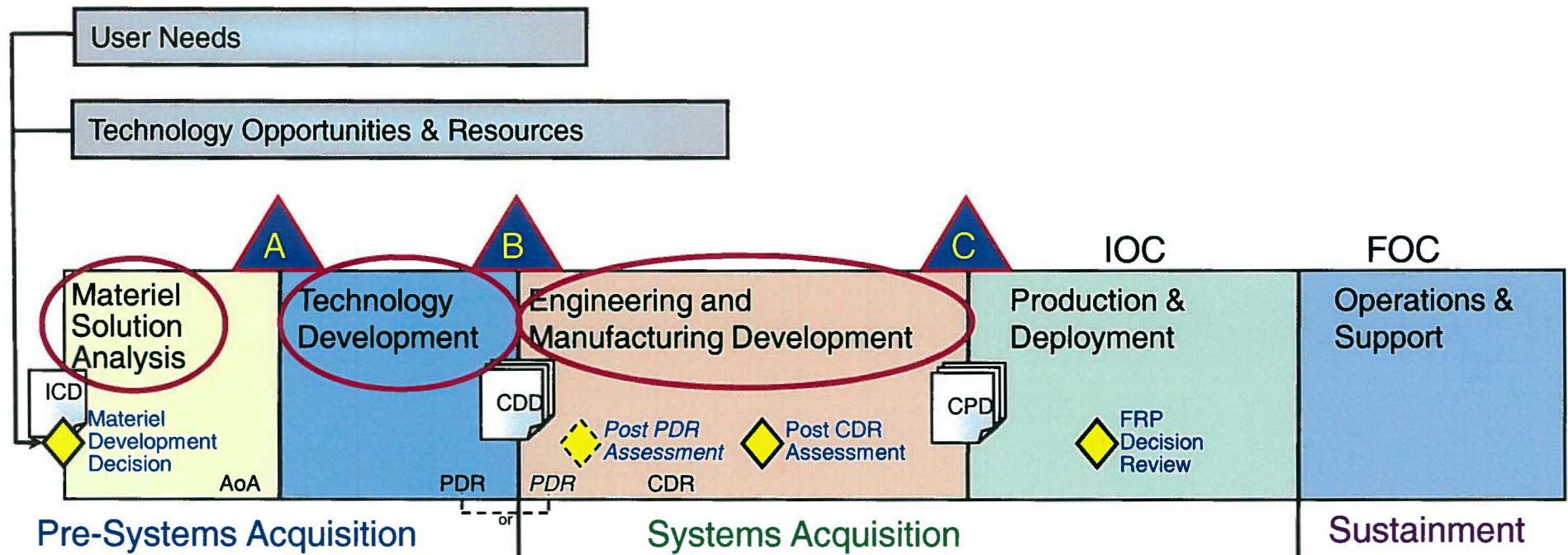
DRAFT



Changes to Decision Points

Old (2003)	New (2008)	Change from 2003
Concept Decision (CD)	Material Development Decision (MDD)	MDD required prior to entering the process at any point
N/A	Post-PDR Assessment	MDA's assessment of PM's PDR Report (if PDR after MS B)
Design Readiness Review DRR	Post-CDR Assessment	MDA's assessment of PM's CDR Report

The Defense Acquisition Management System 2008



Changes to Phases

Old (2003)	New (2008)	Change from 2003
Concept Refinement (CR)	Material Solution Analysis	More robust AoA (result of changes to JCIDS)
Technology Development (TD)		Competitive prototyping
Systems Development & Demonstration (SDD)	Engineering & Manufacturing Development (EMD)	More robust system engineering

MS A – 2366(a) Certification

§ 2366a. Major defense acquisition programs: certification required before Milestone A or Key Decision Point A approval

(a) CERTIFICATION - A major defense acquisition program may not receive Milestone A approval, or Key Decision Point A approval in the case of a space program, until the Milestone Decision Authority certifies, after consultation with the Joint Requirements Oversight Council on matters related to program requirements and military needs—

- (1) that the program fulfills an approved initial capabilities document;
- (2) that the program is being executed by an entity with a relevant core competency as identified by the Secretary of Defense under section 118b of this title;
- (3) if the program duplicates a capability already provided by an existing program, the duplication provided by such program is necessary and appropriate; and
- (4) that a cost estimate for the program has been submitted and that the level of resources required to develop and procure the program is consistent with the priority level assigned by the Joint Requirements Oversight Council.

If, at anytime prior to MS-B approval, the projected cost of the program exceeds the estimate submitted at the MS-A certification by 25%: The PM must notify the MDA. The MDA, in conjunction with the JROC, shall determine if the current estimated cost is consistent with the priority of the program assigned by the JROC. Based on the above determination, the MDA may rescind MS-A approval.

MS B – 2366(b) Certification

§ 2366b. Major defense acquisition programs: certification required before Milestone B or Key Decision Point B approval

(a) CERTIFICATION - A major defense acquisition program may not receive Milestone B approval, or Key Decision Point B approval in the case of a space program, until the milestone decision authority--

(1) has received a business case analysis and certifies on the basis of the analysis that--

- (A) **the program is affordable** when considering the ability of the Department of Defense to accomplish the program's mission using alternative systems;
- (B) **the program is affordable when considering the per unit cost and the total acquisition cost** in the context of the total resources available during the period covered by the future-years defense program submitted during the fiscal year in which the certification is made;
- (C) **reasonable cost and schedule estimates have been developed** to execute the product development and production plan under the program; and
- (D) funding is available to execute the product development and production plan under the program, through the period covered by the future-years defense program submitted during the fiscal year in which the certification is made, consistent with the estimates described in subparagraph (C) for the program; and

(2) further certifies that--

- (A) appropriate market research has been conducted prior to technology development to reduce duplication of existing technology and products;
- (B) the Department of Defense has completed an analysis of alternatives with respect to the program;

MS B – 2366(b) Certification (cont)

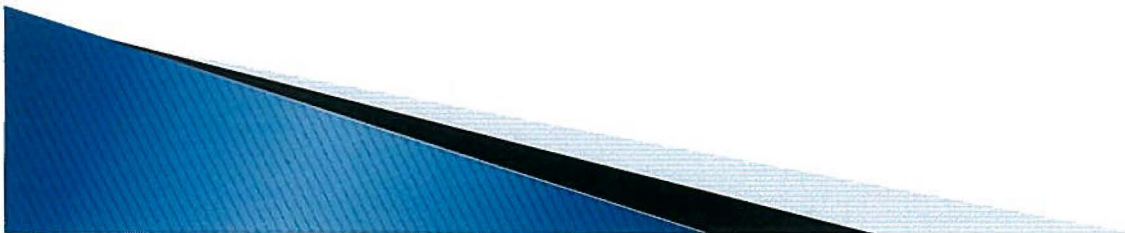
- (C) the Joint Requirements Oversight Council has accomplished its duties with respect to the program pursuant to section 181(b) of this title, including an analysis of the operational requirements for the program;
- (D) the technology in the program has been demonstrated in a relevant environment;
- (E) the program demonstrates a high likelihood of accomplishing its intended mission; and
- (F) the program complies with all relevant policies, regulations, and directives of the Department of Defense.

Pending Legislation – “Weapon Systems Acquisition Reform Act of 2009”

- McCain and Levin co-sponsors (S0454)
- The bill if passed would:
 - Establish a Director of Independent Cost Assessment
 - Presidential appointee
 - Principal advisor to the SECDEF, USD (ATL), and USD(Comptroller) on cost analyses and cost estimation of the acquisition programs for DoD.
 - Authorizes actions in the event of critical cost growth
 1. Terminate the program unless the SECDEF deems the program critical to national security.
 2. If the program is not terminated, then SECDEF must submit to Congress
 - (a) certification that program is critical to national security
 - (b) there are no alternatives to program that will provide equal or greater joint capability.
 - (c) new estimates for program acquisition unit cost or procurement unit cost are reasonable.
 - (d) management structure is adequate to manage and control program acquisition unit cost or procurement unit cost

Bottom Line: Program unit costs are going to be scrutinized like never before

Modernization Challenges



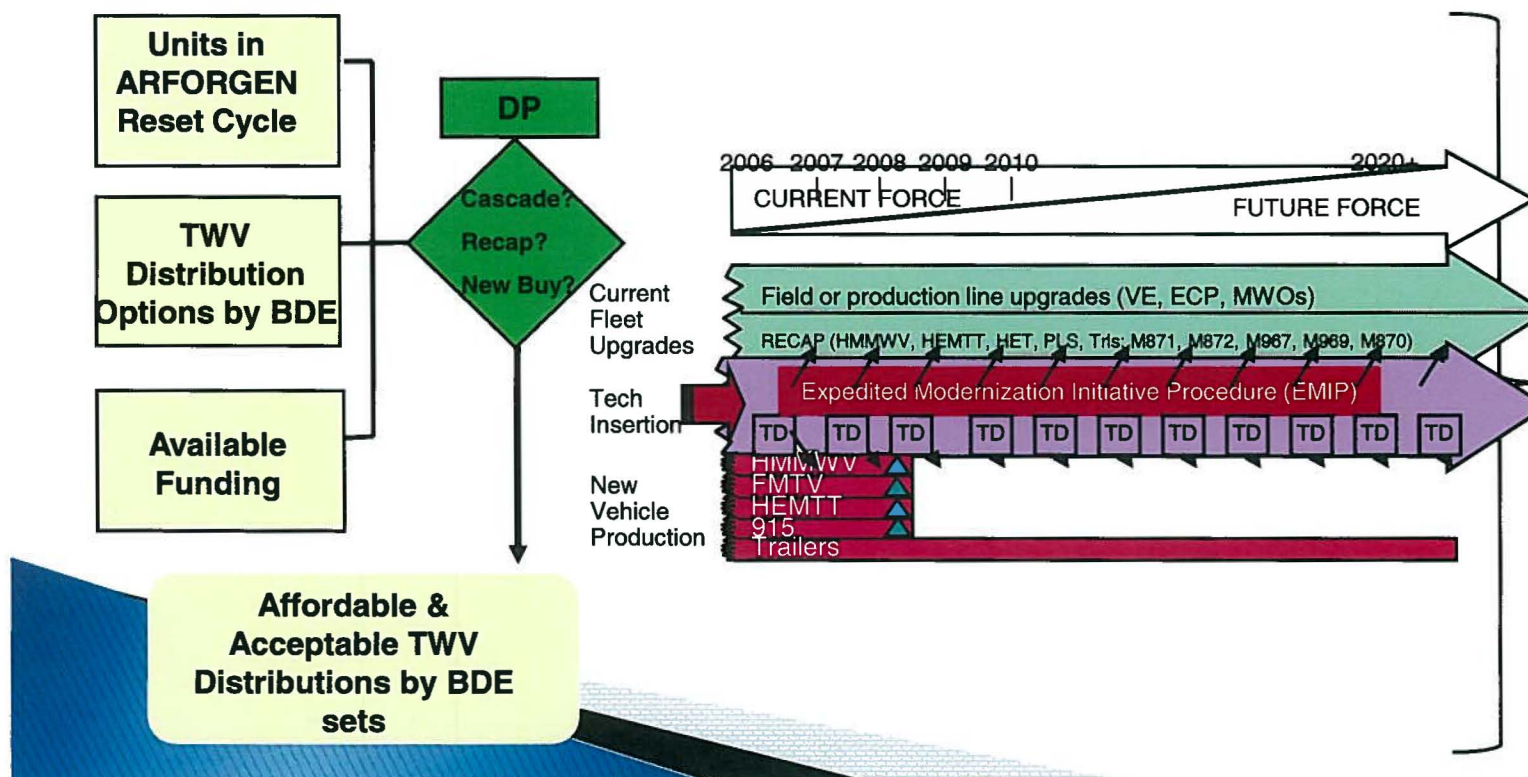
Army Modernization Challenges

1. Rapidly field the best new equipment to the current force
2. Upgrade and modernize existing systems
3. Incorporate new technologies from Future Combat Systems(FCS)
4. Field the FCS Brigade Combat Teams

Army
Modernization
Strategy



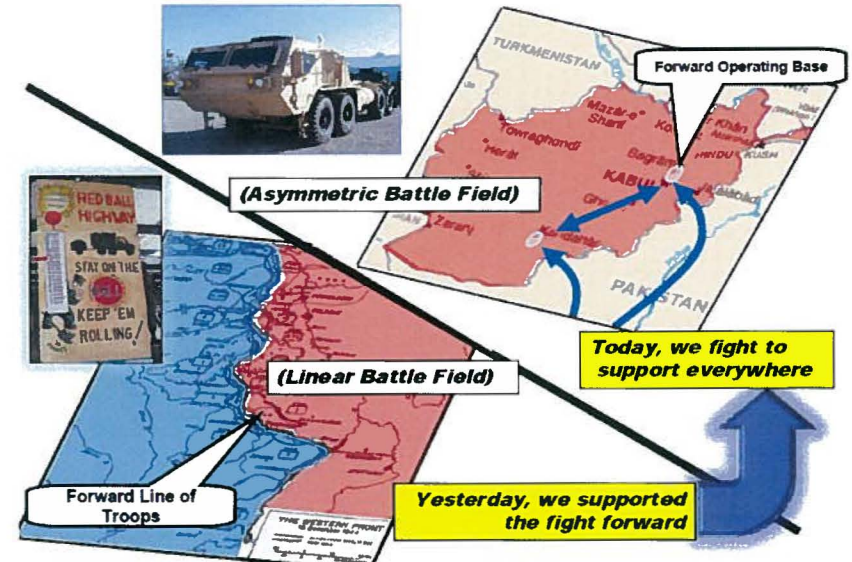
TWV
Modernization
Strategy



TWV Modernization Challenges

- Meeting TWV Requirements continues to be a challenge

- Evolving and Increasing Requirements (Grow the Army, Modularity)
- Decreasing Current Inventory (Obsolescence, Losses)
- Decreasing Support
- Limited Resources



- The TWVs of the future will have to deliver the capabilities the Services need, and be affordable in the quantities the Services require

1988

Unit Cost per Base Vehicle
(Adjusted for inflation)

2008



\$50K



\$150K



\$188K



\$271K

Source: LTG Speaks Presentation
2009 TWV Conference, Monterey, CA

Tactical Systems are Increasing in Complexity

(1984-1993)



HMMWV - M998 (1993-Present)



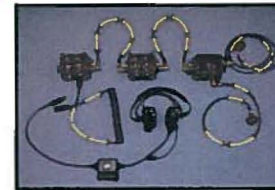
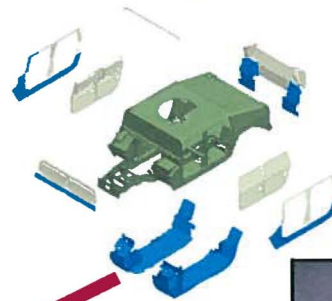
Enhanced Chassis Vehicle

(2007-Present)



MRAP CAT 1 - RG-31

Mission Equipment Packages



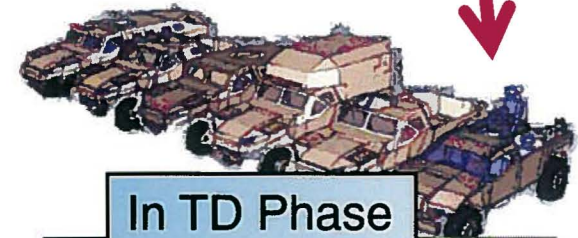
(2009?)



M - ATV



(2013?)

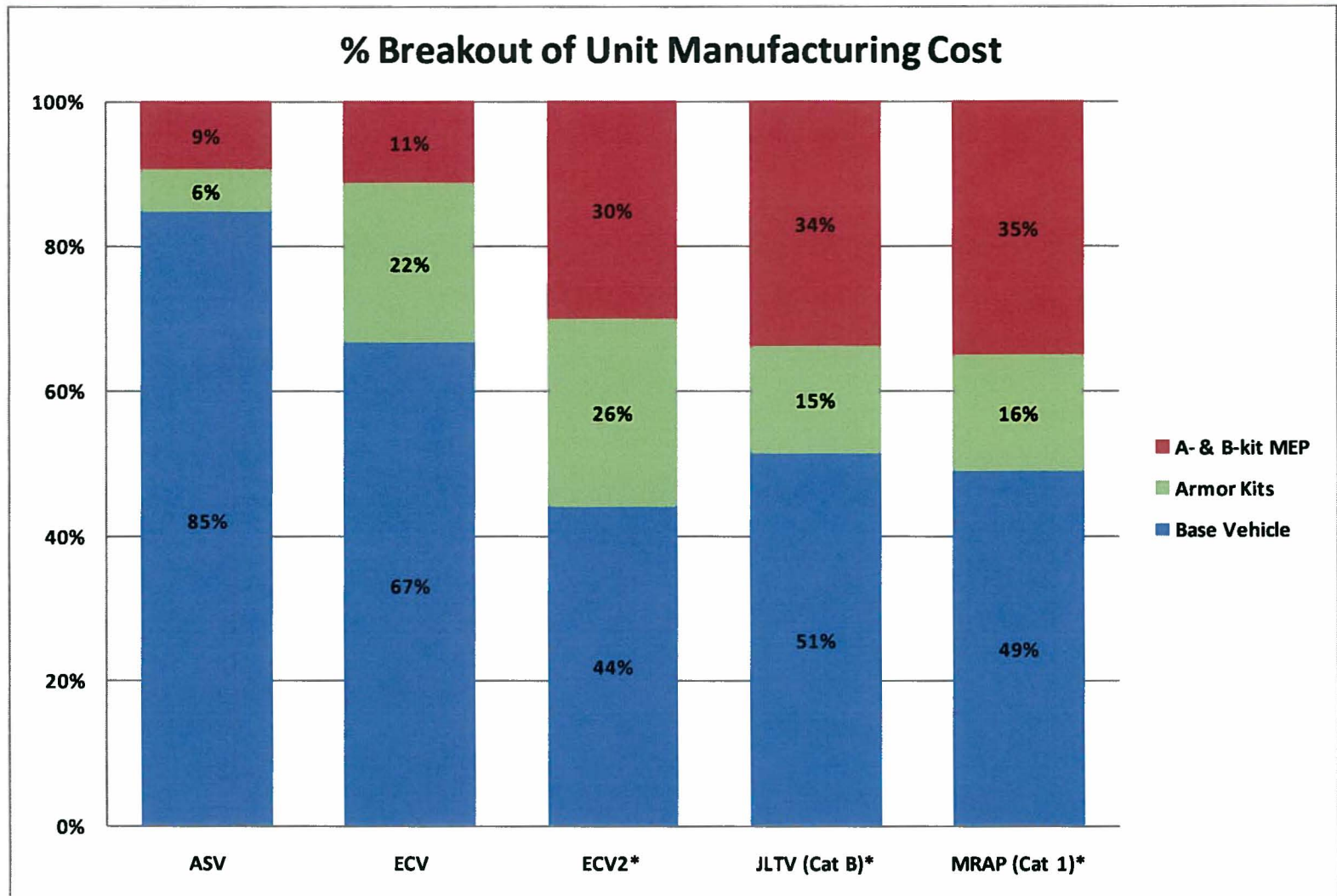


In TD Phase



JLTV Family of Vehicles

Cost Growth of Mission Equipment Packages



* = Based on current estimate and requirements

Case Example:

Joint Light Tactical Vehicle (JLTV)



JLTV – Program Background

- ▶ Oct 06: Program initially proposed to enter at Milestone (MS) B
- ▶ Nov 06: Ground Combat Forces Light Tactical Mobility ICD approved
- ▶ Apr 07: Joint Light Tactical Mobility Concept Decision
- ▶ Sep 07: OSD AT&L Acquisition Decision Memorandum (ADM) redirected JLTV to begin at Pre-MS-A
- ▶ Nov 07: CDD 2.7a released and “locked” for entry into TD Phase
- ▶ Dec 07: MS-A DAB approves MS-A Entry
- ▶ Feb 08: RFP for TD Phase released to Industry
- ▶ Mar 08: Key Programmatic Documents Approved by OSD
- ▶ Apr 08: RFP due from Industry for JLTV FoV TD Phase
- ▶ Oct 08: Three Industry teams awarded contracts
 1. BAE
 2. Lockheed Martin
 3. General Tactical Vehicles
- ▶ Nov 08: Protests filed w/GAO on JLTV FoV TD Contract Awards
- ▶ Feb 09: GAO provides ruling on protests
- ▶ Mar 09: SOW meetings held with Industry teams

The Balanced Solution – JLTV Family of Vehicles and Trailers

PAYLOAD CATEGORY A

Payload: 3,500
Performance: Exceed HMMWV
Transport: 1x EAT* CH/MH 47/ CH53
2x IAT** C130

Sub-Configurations

General Purpose Mobility
(JLTV-A-GP)
(4 Seat) - Army/USMC

ONR & TARDEC Concept Examples



* EAT: External Air Transport
** IAT: Internal Air Transport
*** USMC & Army JLTV-B-ICs
may be the same vehicle

PAYLOAD CATEGORY B

Payload: 4000 / 4500 lbs
Performance: Exceed HMMWV
Transport: 1x EAT* CH 47/53
1x IAT** C130

Sub-Configurations

Infantry Carrier, Fire Team - USMC***
Infantry Carrier, Fire Team - Army***
(JLTV-B-IC) (6 Seat)

Reconnaissance (JLTV-B-REC)
(6 Seat) - Army

Command & Control On The Move
(JLTV-B-C2OTM) (4 Seat) - Army/USMC

Heavy Guns Carrier (JLTV-B-HGC)
(4 Seat+ Gunner) - Army/USMC

Close Combat Weapons Carrier
(JLTV-B-CCWC) (4 Seat) - Army/USMC

Utility (JLTV-B-UTL) (2 Seat) - USMC

Ambulance (JLTV-B-AMB)
(3 Seat+2 Litter) - Army/USMC

ONR CTV Demonstrator Vehicle



ONR & TARDEC Concept Examples



PAYLOAD CATEGORY C

Payload: 5,100 lbs
Performance: Exceed HMMWV
Transport: 1x EAT* CH 47/53
1x IAT** C130

Sub-Configurations

Shelter Carrier / Utility / Prime Mover
(JLTV-C-UTL)
(2 Seat) - Army/USMC

Ambulance (JLTV-C-AMB)
(3 Seat+4 Litter) - Army/USMC

Army FTS Demonstrator Vehicles



ONR & TARDEC Concept Examples



Trailers for each payload category to
have similar payload and mobility
as prime movers.



Prototype will be built in TD Phase

JLTV Cost Estimating Requirements to Date...

	Pre-Milestone A	<u>Requirement</u>
▶ Concept Decision		LCCE
◦ Evaluation of Alternatives		
◦ Review with Service Cost Centers and OSD CAIG Analyst		
▶ Capabilities Description Document		LCCE
◦ Section 6 – Total Ownership Cost KSA		
◦ Section 16 – Program Affordability		
▶ Tactical Wheeled Vehicle Strategy		AUPC
▶ Budget Drills & Reviews		RDTE, PROC, MILCON
◦ Sanity check reviews w/ Service Cost Centers and OSD CAIG Analyst		
▶ Attributes Balancing Analysis	Post-Milestone A	LCCE
▶ Budget Drills & Reviews		RDTE, PROC, MILCON
◦ Sanity Check reviews with Service Cost Centers and OSD CAIG Analyst		

Concept Vehicle Designs

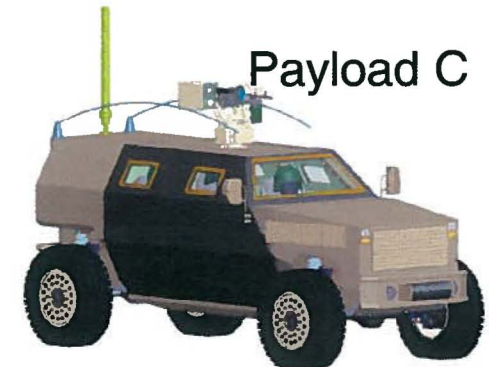
RDECOM (TARDEC)



Payload A



Payload B



Payload C

TARDEC Concept 5 Vehicles Threshold w/ Add-On Armor (Baseline Vehicles - CDD 2.7a)			
	CAT A	CAT B	CAT C
Body, Structure, Integral Armor, Winch, Dashboard	6,132	7,572	5,952
Suspension, Axle, Tires, Steering, Drive Shafts, Seats	3,852	4,812	4,812
Engine, Transmission, Cooling/Electric/Fuel/Auxiliary Systems,	3,210	3,387	3,287
NBC, Fire Suppression, A/C, GPS, IED Jammer	469	701	675
Fuel & Other POL	661	396	496
Weapon/Ring Mount, Pintle	0	300	0
Curb Weight	14,324	17,168	15,222
ECC Payload (includes 3/4 fuel)	1,525	1,153	825
ECC Weight (CW - 1/4 fuel + ECC Payload)	15,709	18,222	15,947
Additional Payload (full fuel, remaining crew w/equipment, 3 DOS, mission equipment, GPK)	1,976	3,660	3,976
Armor B-Kit	6,168	11,319	5,466
Gross Vehicle Weight	23,853	33,201	25,389

Detailed Cost Requests required WBS Expansion

JLTV Unit Manufacturing Cost

WBS Breakout for UMC

- Vehicle
- B-Kit Armor
- Basic Issue Items
- GFE A-Kit
- GFE B-Kit
- Gunner's Protection Kit
- Trailers

Level of Detail in EoA & CDD
(Mar 07)

WBS Breakout for UMC

- Hull/Structure
- Suspension
- Power Pack/Drive Train
- Auxiliary Automotive
- Ring Mount
- B-Kit Armor
- EFP Armor
- Basic Issue Items
- GFE A-Kit
- GFE B-Kit
- Kits
- Gunner's Protection Kit
- Trailers
- G&A and FEE
- Integration and Assembly

Concepts by
RDECOM (TARDEC)
allowed us to expand
WBS

Level of Detail at MS A &
Attributes Balancing Analysis Study
(Dec 07)

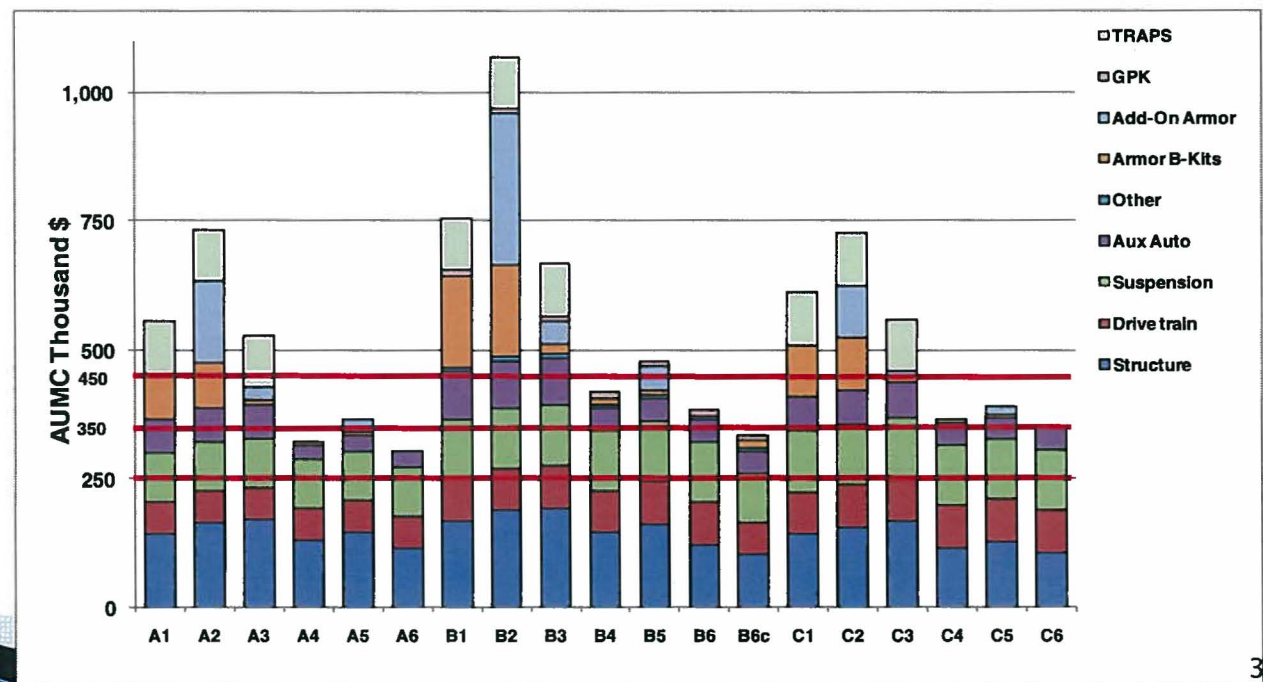
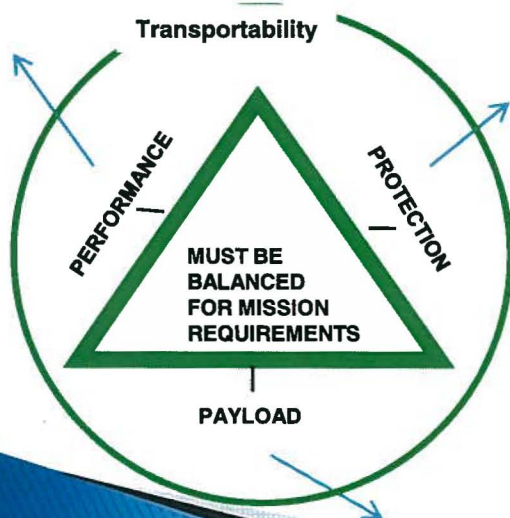
WBS Breakout for UMC

- Tied to approved WBS
Structure for CSDR Plans and
EVM Reporting

Future Level of Detail

Attributes Balancing Analysis Study

- ARCIC directed TRAC to conduct a JLTV attribute balancing analysis to determine the combination of Protection, Performance, and Payload that accomplishes the mission and is technically feasible and affordable for each JLTV mission variant.
- Results would be combined with information from the TD Phase to update CDD.
- TARDEC developed Concept Vehicle Designs (CVD) for the JLTV Mission Role Variants; concept vehicle designs (e.g. A1, B2, C4) represent different sets of attributes.
- The study team measured CVD performance against specific CDD requirements.



Parting Thoughts...

- ▶ Future modernization plans and increasing budget pressures will continue to put pressure to develop detailed unit costs in order to understand the cost drivers.
- ▶ The challenges are exacerbated by the increasing costs of DoD overhead.
- ▶ The Army is developing the TWV Modernization Strategy and due to the densities of the required systems, program unit cost will be a key driver.
- ▶ The costs for Mission Equipment Packages for Army's tactical fleet are unaffordable in today's budgetary environment.
- ▶ Need Industry's help in developing affordable solutions.

"Unit cost and weight will determine the fate of the JLTV program."

Kevin Fahey - PEO Combat Support/Combat Service Support
JLTV TD Phase Start Of Work meeting (Mar 09)